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hand, and on the other with the recent *Soricidæ*. All have been found in the Lower Eocene near Rheims.

*Recent.*—F. E. Geinitz (*Zeit. Deut. Geol. Gesell.*) states that the observations he has made during the last four years on the eastern part of the Mecklenburg coast prove that it is now sinking. —F. Noetling (*loc. cit.*) gives a catalogue of the Diatomacea of the diluvium of Western Prussia, with particulars respecting the manner and quantity of their occurrence. —M. Virlet d'Aoust (*Bull. Soc. Geol. France*, 1883) contributes some valuable remarks upon the incessant formation of minerals, in various rocks, by means of molecular transport and displacement. A geode containing a small bell of the Gallo-Roman epoch is referred to, found probably in an ancient alluvial deposit at Conde'-sur Itón. M. d'Aoust states that he has proved that all flint geodes, buhr-stones, etc., are the result of molecular movements that have taken place since the formation of the rocks, and that limonites and the iron ores of alluvial beds have the same origin and are still in course of formation. He instances a geode found in a vine at Perigueux, a veritable eagle-stone,—hematite enclosing 200 silver pieces of coin of the fifteenth and sixteenth centuries. The re-formation of flint where buhr-stones have been taken out, is spoken of as a fact known to the quarrymen, as also that of grains of iron ore in alluvial clays.

### BOTANY.<sup>1</sup>

THE AUGUST FLORA OF THE DISMAL SWAMP AND VICINITY.—The celebrated Dismal Swamp occupies the greater part of five counties, viz., Nasemond and Norfolk counties in Virginia, and Gates, Camden and Pasquotank counties in North Carolina, covering in all some 300 square miles of surface. A large portion of this vast area, being practically inaccessible, is still unexplored.

The swamp begins about ten miles south-west of Norfolk, and is best reached by taking passage on a small steamboat which plies between that place and Elizabeth City, N. C., *via* the Dismal Swamp canal. This canal passes within three miles of Drummond's lake, with which it is connected by a feeder. There are three or four places in the swamp where the boat makes regular stops, but there is no hotel, or even a decent cabin, within twelve miles of the lake.

The water in the canal is of a sinister blackness, very suggestive of malaria and chills, yet it is both healthful and palatable, and the swamp is the only locality on the southern coast entirely free from malaria. The water has the bitter flavor of tannic acid, derived from the juniper vegetation of the swamp.

A considerable population of whites and negroes subsist by the lumber trade, which is the great industry of this region, although

<sup>1</sup> Edited by PROF. C. E. BESSEY, Ames, Iowa.

there are many good farms along the line of the canal. The soil is a bottomless peat bog which, when drained and sweetened with lime or oyster shells, produces fabulous crops of corn and tobacco.

The prevalent forest growth consists of *Taxodium distichum* (bald cypress), *Cupressus thyoides* (white cedar), *Juniperus virginiana* (red cedar), *Magnolia glauca* (sweet-bay), *Acer rubrum* (red or swamp maple), *Nyssa multiflora* (sour gum), *Liquidambar styraciflua* (sweet gum), and *Quercus aquatica* ? (water oak).

The following herbaceous and arborescent plants were found in flower or fruit in the neighborhood of Drummond's lake during the second week in August: *Nesaea verticillata* (swamp loose-strife), *Saururus annuus* (lizard's tail), *Callicarpa americana* (French mulberry), *Fussia decurrens*, *Ludwigia alternifolia* (false loose-strife), *Rhexia virginica* (meadow-beauty), *Rosa carolina* (swamp rose), *Rubus occidentalis* (black raspberry), *Smilax rotundifolia* (green-brier), *Sabbatia paniculata* (American centaury), *Passiflora incarnata* (passion flower) and *Clethra alnifolia* (white alder). The latter in some places is so abundant that the air is as heavy laden with its perfume as "the zephyrs that wax faint o'er the gardens of Gull in their bloom." The white water lily (*Nymphaea odorata*) is very abundant in the canal, but the yellow water lily (*Nuphar advena*) is scarce, as is also *Pontederia cordata*, although the latter two are abundant in the Pasquotank river, into which the canal empties. The rush family is represented by two species of *Juncus*; the sedge family by the genera *Hemicarpha*, *Scirpus*, *Rhynchospora* and *Carex*; all of which are superabundant. The grass family is represented by the genera *Aurundinaria*, *Cynodon*, *Glyceria*, *Poa*, *Paspalum*, *Briza*, *Uniola*, *Setaria* and *Leersia*. I observed no specimens of *Zizania*, *Andropogon*, *Erianthus* nor *Sorghum*. The fern family is represented only by *Onoclea sensibilis* (sensitive fern), *Woodwardia virginica* (chain fern) and *Aspidium noveboracense* (shield fern).

The southern moss (*Tillandsia usneoides*) is abundant, usually growing on the bald cypress, but frequently on the gum trees. This moss, together with the canebrake (*Aurundinaria macrosperma*), give a decided sub-tropical aspect to the scenery.

Resuming our journey by boat from Drummond's lake, we are, in a short time, out of the canal and steaming down the Pasquotank river towards Elizabeth City, N. C. The latter place lies just beyond the southern extremity of the swamp. The land here is higher and dryer, and covered with a heavy growth of yellow pine, though there are many swampy places. In some of these swamps I found *Asclepias paupercula*, *Spiraea tomentosa* (steeple-bush), *Xyris caroliniana* (yellow-eyed grass), *Habenaria ciliaris* (yellow-fringed orchis), *Pardanthus chinensis* (blackberry lily), *Lilium superbum*, *Sagittaria pusilla* (arrow-head), *Polygala*

*lutea* (milkwort), *Nuphar advena* (yellow water lily) and *Pontederia cordata* (pickerel-weed).

In a damp, shady dell along the Pasquotank river, I discovered the rare *Hydrolea affinis*, *Lobelia cardinalis*, *L. syphilitica*, *L. spicata*, and a form of *Rhexia virginica*, with pure white petals, are abundant, and in such places is usually found a tangle of *Clematis viorna* (leather flower), *Centrosema virginianum* (butterfly-pea), *Apios tuberosa* ('wild bean) and *Mikania scandens* (climbing hempweed). The river at this point is somewhat brackish, and along its margins *Spartina polystachya* (cord grass) grows sparingly.

The "pine openings" on the uplands are usually carpeted with *Sabbatia angularis* and *Stylosanthes*, *Lespedeza*, *Desmodium*, *Crotalaria*, *Medicago* and other Leguminosæ. On a barren heath, a short distance from the town, I found a thrifty colony of *Rosa bracteata*, which has not heretofore been found growing without cultivation north of Mobile, Ala.

In addition to the above, almost all the plants found in the Dismal Swamp are also found growing in this neighborhood, where they may be collected with much less trouble than in the swamp.

The flora of the swamp, it must be confessed, is rather tame and monotonous, but if it were possible to penetrate into the remoter fastnesses many new names would doubtless be added to systematic botany.—Gerald McCarthy, Washington, D. C.

LABORATORY NOTES.—I. *Development of Pollen*.—A most interesting and suggestive laboratory study consists in watching the development of pollen. I have found two plants especially valuable for such study, viz., Scotch pine and the common lilac. In the pine the student should commence work as soon as the clustered flowers begin to show themselves in early spring. Carefully made cross sections, made at intervals of a few days, show the gradual development first of the mass of mother-cells and later of the pollen itself. By care there is little difficulty in observing the prothallial cells in the young and thin-walled pollen cells.

The lilac is also easily studied, on account of its flower buds being so massed together as to permit the ready making of thin sections. In this case again the work must begin early, and should continue at intervals of a few days until the pollen is fully developed.

2. *The flow of Sap (water)*.—A neat demonstration of the current explanation of the cause of the flow of water from trees in early spring may be made as follows: During a cold day cut a small branch from a maple tree, bring it into the laboratory and warm it quickly, when the water will flow freely; now cool it, when the flow instantly ceases; warm again, and the flow will be resumed, and so on.

ALLEN'S CHARACEÆ AMERICANÆ EXSICCATÆ.—We have, from time to time, noticed this important publication of specimen s o

these little-known plants. Fasciculus iv, just received, brings the number of species up to forty. As with the previous fasciculi, the specimens are excellent, and the labeling leaves nothing to be desired. The species are as follows: *Nitella tenuissima*, *N. glomerulifera*, *N. opaca*, *N. minuta*, *Tolypella comosa*, *T. fimbriata*, *T. intertexta*, *Chara hydropitys*, var. *genuina*, *C. sejuncta*, *C. gymnopus*, var. *armata*. A New Zealand species, *Nitella tricellularis* is also added.

The specimens were almost entirely collected in New York and New Jersey, indicating that they are, without doubt, to be found abundantly almost everywhere throughout the country, if collectors will but search carefully for them. These fasciculi are not sold, but may be obtained in exchange for specimens of Characeæ. One hundred specimens of any desirable form will be considered equivalent to a fasciculus in exchange. All correspondence and specimens should be addressed to Dr. T. F. Allen, 10 East 36th street, New York city. May we not ask the readers of the NATURALIST everywhere to keep a sharp lookout for the Characeæ?

BOTANICAL NOTES.—In the Proceedings of the Davenport Academy of Sciences, Vol. iv, Dr. C. C. Parry publishes a paper on the species of Arctostaphylos, natives of the Pacific coast of the United States. A new species (*A. oppositifolia*) is described from Lower California.—In another paper in the same volume, Dr. Parry describes four other new species from Southern and Lower California, viz., *Phacelia saffrutescens*, *Ptelea aptera*, *Polygala fishiæ*, *Gilia orcuttii*.—Dr. Gray's paper in the December *American Journal of Science*, on "Some points in Botanical Nomenclature," should receive a thoughtful reading by all our systematic botanists. It is to be hoped that DeCandolle's "Nouvelles Remarques sur la Nomenclature Botanique," of which Dr. Gray's paper is a review, will soon appear in English dress in this country. Uniformity of usage in matters pertaining to nomenclature is so desirable, that no one ought to consider himself fitted to describe and name a species until he has acquainted himself fully with the usages of naturalists. Every botanical library should contain the Dall Report on Nomenclature, published in the Proceedings of the American Association for the Advancement of Science, and the Laws of Botanical Nomenclature, by Alph. DeCandolle, of which an English translation by Dr. Weddell appeared in 1868.—The January *Botanical Gazette* contains a suggestive article, by Dr. Sturtevant, on the origin of domesticated vegetables. He proposes to study the origin of domesticated plants by taking into consideration their variations. He is led to infer long prehistoric culture of many American plants, as maize, pumpkin, tomato, potato, etc. Moreover, he considers it not improbable that many of our so-called natural species are but escapes from a prehistoric cultivation.—In the December *Torrey Bulletin* E. L. Greene

describes eight new species of flowering plants from S. W. United States; C. H. Peck notices a new genus (*Neopeckia*) established by Saccardo, while Dr. Vasey describes two new Western grasses. —Lists of the plant catalogues of Indiana, Illinois, Michigan and Wisconsin are given in the same number by W. R. Gerard and N. L. Britten. —Henry and James Groves continue their notes on British Characeæ in the January *Journal of Botany*, recording and figuring *Chara braunii*, found in Britain for the first time last September. —J. G. Baker, in the same number, continues his synopsis of the genus *Selaginella*, bringing the number of species up to one hundred and nine. —Dr. Farlow's Notes on the cryptogamic flora of the White mountains in *Appalachia* (Jan., 1884) is an interesting contribution to our knowledge of the lower plants of this region. Six new species of fungi are described, viz., *Doassansia epilobii*, *Propolis circularis*, *Stictis tsugæ*, *Cercospora pyri*, *Ramularia oxalidis*.

#### ENTOMOLOGY.

EGG-LAYING HABITS OF THE EGG-PARASITE OF THE CANKER WORM.—In our "Guide to the Study of Insects," (p. 200) we have briefly referred to a minute species of *Platygaster* which lays its eggs in those of the canker worm. We noticed on a pleasant day (Nov. 28, 1863, or a year or two earlier) two of these *Platygasters* upon two bunches of freshly laid eggs of the canker-worm moth, probably *Anisopteryx pometaria* Mann. We placed the eggs and ichneumons in a box, and returning to our room at the Museum of Comparative Zoölogy, watched the movements of the minute *Platygasters* with a lens of twenty-five diameters. One of them thrust its hind body down between the eggs, and while the rest of the body was still, and supported by the fore and hind legs, the wings resting on the top of the egg it was piercing, the antennæ were constantly vibrating. There could be seen a slight motion of the abdomen, the ovipositor meanwhile pushing and boring into the side of the egg. The operation of oviposition required from one to three, generally three, minutes. When the egg had been deposited in the right place, the *Platygaster* ran swiftly about, vibrating its antennæ more rapidly than before, until finding a suitable egg it suddenly paused, dropped its abdomen down between the eggs, and went through the same manœuvres as we have described. Sometimes it would suddenly take to its wings and fly off.

The other *Platygaster* kept on the under side of the loose bunch of eggs, where it found no good opportunity to oviposit. It was very uneasy, and would constantly run about from egg to egg. It would try for three or four minutes in vain to pierce the egg-shell, and we could see it thrust out its rather long, slender and sharp ovipositor, and apparently try to drill through the obdurate shell without success. It never attempted to pierce the